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Other surgical techniques for osteoarthritis

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Prior to the need for arthroplasty, there are numerous surgical options for management of osteoarthritis. This chapter is aimed at addressing the current state of knowledge and practice regarding: (1) arthroscopic lavage and debridement; (2) articular surface stimulation by means of penetration or microfracture; (3) high tibial osteotomies; (4) preventative ligament stabilization and joint distraction; and (5) transplantation of soft tissue, osteochondral, chondrocyte and matrix implantation as well as use of growth factors. Evidence is reviewed regarding the outcomes and indications for each of these operations, and where evidence is lacking, needs for further research are indicated. Future directions building upon promising early results of articular surface regeneration are also described.

Key words: articular surface; lavage; microfracture; abrasion; osteotomy; joint distraction; OATS; ACI; MACT.

Many patients and providers think only of arthroplasty when considering surgical options for osteoarthritis. However, there are several other surgical options for osteoarthric joints—including irrigation and debridement and joint surface repair—which are also therapeutic alternatives. Procedures which may be offered for focal joint degeneration include those that may promote formation of a new articular surface by altering joint surface loading (e.g. osteotomy or joint distraction) and those that may promote the formation of a new articular surface through introduction of new tissue

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(microfracture, abrasion, or cell implantation). Some of these procedures can reduce pain and allow restoration of function, particularly in younger patients, and may delay or obviate the need for joint replacement surgery.

WHAT IS THE EVIDENCE REGARDING ARTHROSCOPIC LAVAGE AND DEBRIDEMENT?

Arthroscopic lavage

The United States National Center for Health Statistics reported that in 1996 approximately 657,000 knee arthroscopy procedures were performed.[1] The theoretical basis for performing arthroscopic lavage (irrigating the knee joint with copious amounts of fluid) for knee osteoarthritis is to clear debris, chondrolytic enzymes and inflammatory cytokines that might contribute to synovitis. One multicenter randomized controlled trial comparing arthroscopy alone (250 mL irrigation) with arthroscopy followed by an additional 3000 mL irrigation revealed no change in aggregate WOMAC (Western Ontario and McMaster Universities) score, but did demonstrate reduction in pain by both visual analogue scale and WOMAC pain subscale at 12-month follow-up.[2] This effect was more pronounced in subjects with positively birefringent crystals on synovial fluid analysis. However, the mechanism for such an effect has not been elucidated. A placebo-controlled double-blinded study comparing subjects receiving placebo arthroscopy with arthroscopic lavage revealed no difference between groups at any point during 2-year follow-up on the knee specific pain scale or the pain subscale of the arthritis impact measurement scale.[3] The results of this well-designed trial strongly suggest that the reduction in pain with knee arthroscopic lavage may be attributable to a placebo effect. Given the lack of evidence to support this procedure, arthroscopic lavage has fallen out of favor for knee osteoarthritis management.

Arthroscopic debridement

Joint surface debridement entails shaving fibrillated cartilage, removing chondral and osteochondral flaps and free cartilage, and resecting synovium and osteophytes. The goal of debridement is to alleviate symptoms through improving joint congruity, minimizing nida for irritation of the articular surface, and optimization of load-bearing.[4,5] Debridement has been used most extensively for treatment of meniscal tears in the knee joint, but also for degenerative joint disease of the elbow, shoulder, hip and ankle. Prior to arthroscopy, debridement was performed through arthrotomies.[6,7] However, even with the advent of arthroscopy, debridement has not been shown to alter the course of osteoarthritis, relieve pain, or improve function over a long term.[8–12]

Uncontrolled studies of arthroscopic debridement have demonstrated clinically significant improvement in quality of life in less than half of patients, and even in cases of improvement results have been transient.[13–15] Such transient relief has been reported for patients with ‘locking’ or ‘give-way’ symptoms, Fairbank grade 0–I or Outerbridge grade I–III changes, whereas poor or no response has been reported for patients with loading symptoms, higher-grade OA, or multi-compartment involvement.[16] However, studies which have reported improvement have been uncontrolled and/or